

# PRODUCT CONFORMITY CERTIFICATE

This is to certify that the

**VEGAPULS 80GHz smart radar level transmitters C21, C22, 21 and 31 with VEGAMET 861/862 controller**

Manufactured by:

**VEGA Grieshaber KG**

Am Hohenstein  
77761 Schiltach  
Germany

has been assessed by CSA Group  
and for the conditions stated on this certificate complies with:

**Performance Standards and Test Procedures for Continuous Water Monitoring Equipment, Part 3: Performance standards and test procedures for water flowmeters, Environment Agency, version 4, March 2020**

The combined performance characteristics ( $U_c$ , the expanded uncertainty) are as follows:

VEGAPULS C21/C22 analogue 4 to 20 mA is **0.173% (Class 1)**  
VEGAPULS C21/C22 digital HART values is **0.056% (Class 1)**  
VEGAPULS 21/31 analogue 4 to 20 mA is **0.170% (Class 1)**  
VEGAPULS 21/31 digital HART values is **0.044% (Class 1)**

VEGAPULS C21/C22 with VEGAMET 86x is **0.091% (Class 1)**  
VEGAPULS 21/31 with VEGAMET 86x is **0.087% (Class 1)**

Certification Range:

0 to 5m

Project No.: 80056644  
Certificate No: Sira MC210360/00  
Initial Certification: 21 April 2021  
This Certificate issued: 21 April 2021  
Renewal Date: 20 April 2026



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MCERTS is operated on behalf of the Environment Agency by

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**Approved Site Application**

*Any potential user should ensure, in consultation with the manufacturer, that the monitoring system is suitable for the intended application. For general guidance on monitoring techniques refer to the Environment Agency Monitoring Technical Guidance Notes available at [www.mcerts.net](http://www.mcerts.net)*

The product is suitable for use, where it is appropriate, for regulated applications such as abstraction, effluent discharge, ultraviolet disinfection and industrial processing.

**Basis of Certification**

This certification is based on the following Test Report(s) and on CSA's assessment and ongoing surveillance of the product and the manufacturing process:

- Laboratory Testing - Sira Evaluation Report, dated 23 March 2021, ref. 80056644.
- Field Test - WRc Ref: UC 14792/17297-0, November 2020, version 3

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## Product Certified

The 80GHz VEGAPULS radar level measuring system with controller option consists of the following parts:

The transmitter (also as standalone), with the following variants:

- VEGAPULS C21 - axial cable entry
- VEGAPULS C22 - lateral cable entry
- VEGAPULS 21 - without integral display
- VEGAPULS 31 - with integral display

The VEGAPULS MCERTS certified radars can be a combination of product coding but must have code 'H' ("Two-wire 4 ... 20mA/HART"), such as 'VEGAPULS C21 \* \* \* \* \* H \*'.

The controller, which allows totalisation function and datalogging, with the following variants:

- VEGAMET 861 - single channel
- VEGAMET 862 - dual channel

The certificate applies to all instruments fitted with software versions, detailed as follows:

VEGAPULS C21 - firmware version 1.1.0 onwards (serial number 46014226 onwards)

VEGAPULS C22 - firmware version 1.1.0 onwards (serial number 47135254 onwards)

VEGAPULS 21 - firmware version 1.1.0 onwards (serial number 44801788 onwards)

VEGAPULS 31 - firmware version 1.1.0 onwards (serial number 47183542 onwards)

VEGAMET 861 - single channel - firmware version 1.0.0 onwards (serial number 47170914 onwards)

VEGAMET 862 - dual channel - firmware version 1.0.0 onwards (serial number 47238359 onwards)

### Note:

The certification range of all the VEGAPULS radar level sensors is 0 to 5.0 metres. However, the manufacturer recommends a minimum distance of 0.25m from the radar reference plane for optimum accuracy.

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### Certified Performance

The instrument was evaluated for use under the following conditions:

Ambient Temperature Range: VEGAPULS radars -40°C to +80°C  
 \*VEGAMET 86x controllers (Note 1) -20°C to +60°C  
 Instrument IP rating: VEGAPULS C21/22 IP66/IP68 (IEC 60529)  
 VEGAPULS 21/31 IP66/IP67 (IEC 60529)

The instruments meet MCERTS **Class 1** requirements for the combined performance characteristic as specified in Table 7 of the MCERTS performance standard. Details of individual performance characteristics are summarised below:

Results are expressed as error % of certification range, unless otherwise stated.

Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Protection against unauthorised access	6-digit protection code					Clause 3.1.2
Units of measurement	Units include metres <sup>3</sup> and litres					Clause 3.1.6 and 3.1.7
Indicating device and/or analogue or digital output signal	All radar transmitters have analogue output of flow rate. The VEGAPULS 31 has an integral display. The VEGAMET controllers provide indication.					Clause 3.1.3
Resolution	1mm (0.02%)					Clause 3.1.14 ≤1mm, class 1
<b>Combined performance characteristic (U<sub>c</sub>)</b>					Note 2	Clause 6.4, table 7 <b>0.2%, class 1</b>
<b>VEGAPULS C21/C22 (4-20mA)</b>	<b>0.173</b>					
<b>VEGAPULS C21/C22 (digital HART)</b>	<b>0.056</b>					
<b>VEGAPULS C21/C22 &amp; *VEGAMET86x</b>	<b>0.087</b>					
<b>VEGAPULS 21/31 (4-20mA)</b>	<b>0.170</b>					
<b>VEGAPULS 21/31 (digital HART)</b>	<b>0.044</b>					
<b>VEGAPULS 21/31 &amp; *VEGAMET 86x</b>	<b>0.080</b>					
<b>*VEGAMET86x</b>	<b>0.091</b>					
Warm-up time					<15 secs	Clause 6.1.2 To be reported
Loss of power VEGAPULS C21/C22 VEGAPULS 21/31					No changes No changes	Clause 6.3.1 To be reported
Mean error VEGAPULS C21/C22 VEGAPULS 21/31	0.017 0.006					Clause 6.3.2 +/-0.1%, class 1
Repeatability VEGAPULS C21/C22 VEGAPULS 21/31	0.021 0.007					Clause 6.3.2 0.05%, class 1

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Supply voltage VEGAPULS C21/C22 VEGAPULS 21/31 *VEGAMET 86x	0.012 0.003 0.028					Clause 6.3.3 0.025%, class 1
Output impedance (10 Ω to 545 Ω) VEGAPULS C21/C22 VEGAPULS 21/31 *VEGAMET 86x	0.003 0.010 0.022					Clause 6.3.4 0.025%, class 1
Ambient air temperature (-40°C to +80°C, -20°C to +60°C, *note 2) VEGAPULS C21/C22 VEGAPULS 21/31 *VEGAMET 86x	0.141 0.143 0.062					Clause 6.3.6 0.025%, class 1
Relative humidity (>95%) VEGAPULS C21/C22 VEGAPULS 21/31 *VEGAMET 86x	0.006 0.012 0.008					Clause 6.3.6 0.025%, class 1
Accuracy of computation	0.025					Clause 6.3.11 0.025%, class 1
User defined stage-discharge equation	0.020					Clause 6.3.12 0.025%, class 1
Response time VEGAPULS C21/C22  VEGAPULS 21/31					increase 6.05s decrease 6.54s increase 4.94s decrease 4.74s	Clause 6.3.19 <30 seconds
Error under field conditions VEGAPULS C21/C22      VEGAPULS 21/31					Max error 0.25% Min error 0.001% Mean error 0.04% Proportion of errors ≤0.2% = 100% Proportion of errors ≤0.5% = 100%  Max error 0.27% Min error 0.001% Mean error 0.05% Proportion of errors ≤0.5% = 100% Proportion of errors ≤1.5% = 100%	Clause 7.3      Class 1      Class 1

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Test	Results expressed as % of the certification range				Other results	MCERTS specification
	<0.5	<1	<2	<5		
Up time VEGAPULS C21/C22 VEGAPULS 21/31					100% 100%	Clause 7.4 >95%
Maintenance VEGAPULS C21/C22 VEGAPULS 21/31					None None	Clause 7.5 to be reported

Note 1 - 'VEGAMET 86x' covers both controllers of the type 'VEGAMET 861' and 'VEGAMET 862'.

Note 2 - The test results contributing to the determined  $U_c$  values are detailed in the Sira Evaluation Report (ref. 80056644).

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## Description

### **Radar level sensors**

The **VEGAPULS C 21, VEGAPULS C 22, VEGAPULS 21** and **VEGAPULS 31** are smart, compact, 80 GHz, non-contact radar level transmitters that can be applied on MCERTS open channel flow applications providing flow rate measurement as stand-alone devices when used with an appropriate structure. The 80 GHz VEGAPULS provides measurement data without sunshades or separate ambient temperature measurement. These VEGAPULS radars can be used in a wide range of level applications across the water and wastewater industry.

The **VEGAPULS** sensors provide a multi-variable HART 7 digital signal allowing flow rate, level, measurement reliability and temperature to be read by a suitable HART data logger or remote telemetry unit. They can provide an analogue 4 to 20mA signal proportional to flow rate.

The **VEGAPULS** radar can be set-up remotely via secure Bluetooth communications using the VEGA Tools App on a mobile device or using PACTware/VEGA DTM software on a laptop/PC. In addition, laptop/PC set-up can be achieved by connecting via the signal cable using HART communications.

The **VEGAPULS C 21** and **VEGAPULS C 22** smart radar sensors have an integral signal cable and ingress protection IP66/IP68. The **VEGAPULS 21** and **VEGAPULS 31** have a cable gland connection IP66/IP67. The **VEGAPULS 31** has an integral display.

### **Controllers**

The **VEGAPULS C 21, VEGAPULS C 22, VEGAPULS 21** and **VEGAPULS 31** smart radar sensors can be used in combination with **VEGAMET 861** single channel and **VEGAMET 862** dual channel digital input controllers to provide the totalization function and data logging with back-up to an SD card. The **VEGAMET861/862** controllers have fully programmable relays for alarms and remote totalization and analogue 4 to 20 mA outputs proportional to flow rate.

The **VEGAPULS** radar level sensors and the **VEGAMET 861/862** controllers have 32 point flow linearization curves capability using a simple flow linearization wizard in the VEGA Tools App or PACTware/VEGA DTM software. Flow curve calculations to ISO 4359, ISO 1438 and ISO 3846, as well as 32-point user programmable curves, are standard.

The **VEGAPULS** radar level sensors and **VEGAMET** controllers have full diagnostics according to NAMUR NE 107.

## General Notes

1. This certificate is based upon the equipment tested. The Manufacturer is responsible for ensuring that on-going production complies with the standard(s) and performance criteria defined in this Certificate. The Manufacturer is required to maintain an approved quality management system controlling the manufacture of the certified product. Both the product and the quality management system shall be subject to regular surveillance according to 'Regulations Applicable to the Holders of CSA Certificates'. The design of the product certified is defined in the CSA Design Schedule V00 for certificate No. Sira MC210360/00.
2. If the certified product is found not to comply, CSA Group should be notified immediately at the address shown on this certificate.
3. The certification marks that can be applied to the product or used in publicity material are defined in 'Regulations Applicable to the Holders of CSA Certificates'.
4. This document remains the property of CSA Group and shall be returned when requested by CSA Group.

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